## Boeing Realty Corporation

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03 May 2002 C6-BRC-T-02-010

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

Los Angeles Region 320 W. 4<sup>th</sup> Street, Suite 200

Los Angeles, CA 90013

Attention:

John Geroch

Subject:

SITE CLOSURE EVALUATION – PARCEL A DEEP SOIL, FOR BOEING REALTY CORPORATION, FORMER C-6 FACILITY, 19503 SOUTH NORMANDIE AVENUE, LOS ANGELES, CA

Dear Mr. Geroch:

Please find enclosed for your review, a copy of the subject document prepared by Haley & Aldrich for Boeing Realty Corporation.

If you have any questions concerning this document, please contact the undersigned at 562-593-8623.

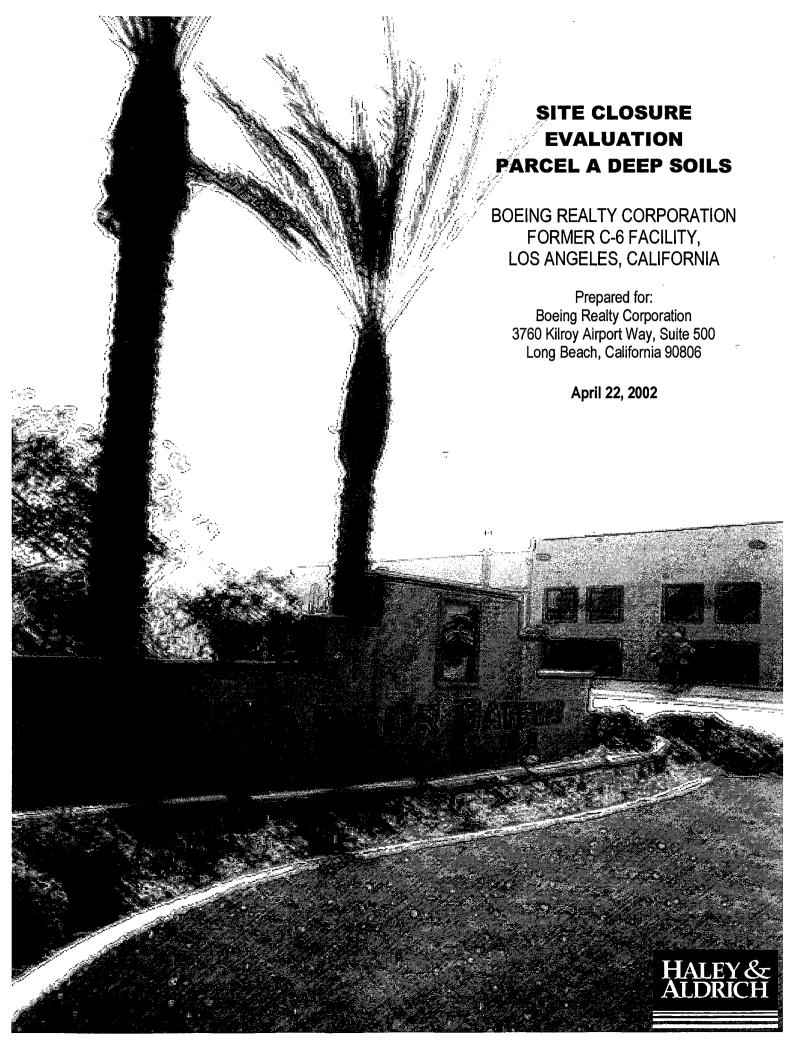
Sincerely,

Stephanie Sibbett

**Boeing Realty Corporation** 

Cc: Mario Stavale, Boeing Realty Corporation

enclosure



UNDERGROUND ENGINEERING & ENVIRONMENTAL SOLUTIONS

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22 April 2002 File No. 27285-003

Mr. Brian Mossman Boeing Realty Corporation 3855 Lakewood Blvd. Building 1A MC D001-0097 Long Beach, California 90846

Subject:

Site Closure Evaluation - Parcel A Deep Soil, Boeing Realty Corporation (BRC) Former C-6 Facility, Los Angeles, California

Dear Mr. Mossman:

Haley & Aldrich, Inc. (Haley & Aldrich) has conducted an evaluation for recommended closure of deep soil (vadose zone soil at depths greater than 12 feet below ground surface [bgs]) at the subject property (Parcel A). Parcel A is one of four parcels (Parcels A through D) of the BRC Former C-6 Facility (Facility), at 19503 South Normandie Avenue, in Los Angeles, California (Figures 1 & 2). This evaluation includes all areas of Parcel A with the exception of the Harborgate Way Easement which is included in the Parcel C closure program (Figure 2).

#### EXECUTIVE SUMMARY

BRC has completed their investigation and risk assessment evaluation of deep soil within Parcel A. These activities included:

- Investigation of the vertical and lateral extent of soil impacts
- Investigation of impacts to groundwater
- Groundwater monitoring for the presence of volatile organic compounds (VOCs)
- Preparation of risk assessment work plans
- Evaluation of the potential for adverse health effects from residual soil and groundwater impacts
- Evaluation of the potential impacts on groundwater quality from residual soil impacts

Based on the closure evaluation presented herein, it is recommended that the Regional Water Quality Control Board - Los Angeles Region (RWQCB) issue a "no further action" letter for deep soil impacts in Parcel A based on the following information and conclusions:

1. Both the vertical and lateral extent of soil impacts related to onsite operations have been delineated.

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- 2. In a letter dated April 21, 1998 (RWQCB 1998), the RWQCB issued a letter of no further action for shallow soil in Parcel A. The RWQCB also indicated that the California Human and Ecological Risk Division (HERD) agreed with the conclusion in the post-demolition risk assessment and that residual shallow soil impact risks fall within a range of values that HERD determines to be acceptable for the proposed land use, and the impact risks will not pose significant health risks for future site occupants.
- 3. The following additional potential exposure pathways were evaluated using deep soil investigation results:
  - inhalation of VOCs in indoor air from upward VOC vapor migration from groundwater into onsite buildings, and
  - inhalation of VOCs in indoor air due to VOC migration from deep soil leachate to groundwater and subsequent upward VOC vapor migration from groundwater into indoor air.

Deep soil does not pose a risk to human health greater than acceptable levels from inhalation of VOCs from upward VOC vapor migration into onsite buildings. No other exposure pathways are considered complete for deep soil.

Adding the estimated risks for Parcel A from the above-listed pathways to the risks calculated for potential on-site receptors, as presented in the post-demolition risk assessment, do not result in risks greater than the Office of Environmental Health Hazard Assessment (OEHHA)-approved acceptable risk levels for the BRC Former C-6 Facility property.

4. The existing residual chemical concentrations in Parcel A deep soil do not pose a threat to groundwater quality at levels greater than MCLs, with the potential exception of 1,1-DCE and TCE. Comparison of these estimated maximum VOC concentrations in groundwater, due to leaching, to measured VOC concentrations in groundwater indicates that existing concentrations in soil will not further degrade existing groundwater quality.

## 1.0 BACKGROUND

#### 1.1 SITE LOCATION

Parcel A is located within the BRC Former C-6 Facility at 19503 South Normandie Avenue, in Los Angeles, California. The approximate location of Parcel A is depicted in Figure 1. A site plan is presented as Figure 2.

#### 1.2 SITE LAND USE HISTORY

Parcel A occupies approximately 50 acres in the northern portion of the Facility property and is bordered by West 190th Street to the north, railroad tracks and South Normandie Avenue to the east, Parcel C to the south, and Parcel B to the west (Figure 3). Prior to building demolition, Parcel A contained Buildings 34, 36, 37, 61, 44, 45, 57, and 67; the northern portions of Buildings 29 and 58; and the chrome recovery system (CRS) located north of Building 40. The site also contained railroad tracks located on the eastern and western portions of Parcel A and a parking lot located on the western portion of Parcel A. Aerial photographs indicate the area was farmland before the 1940s. Industrial use of Parcel A began in 1941 when it was developed as part of an aluminum reduction plant. Prior to 1952, the aluminum reduction plant was converted to a steel manufacturing facility. In 1952, the Douglas Aircraft Company (DAC) used the facility to manufacture aircraft and aircraft components until approximately 1992. DAC used the buildings primarily for office space and storage. The property ownership was transferred to The Boeing Company during a merger with McDonnell Douglas Corporation in 1997. Currently, the former manufacturing facility has been demolished and approximately 40% of Parcel A has been redeveloped into an auto dealership.

## 1.3 PARCEL A EASEMENT EXCLUSION

An irregularly shaped easement just beyond the northeast corner of Parcel C, known as the Harborgate Way Easement, is excluded from evaluation under this site closure evaluation of Parcel A. The legal description of the easement is contained in a Declaration of Easements by BRC dated December 28, 1998 and is shown in Figure 2. The purpose of the easement is to identify the portion of Parcel A deep soil impacts related to sources originating in Parcel C. Shallow soil within the easement was closed by the RWQCB on April 21, 1998. The deep soil VOC impacts in this easement are currently being addressed with a soil vapor extraction (SVE) remediation system which is part of the Parcel C Building 1/36 remediation program. This SVE system was approved by the RWQCB on November 16, 2001. Upon completion of SVE operations within the Parcel A Harborgate Way Easement, a supplemental request for deep soil closure will be submitted to the RWQCB.

## 2.0 SITE INVESTIGATION RESULTS

## 2.1 SITE INVESTIGATION HISTORY

An evaluation of the previous investigation was conducted to assess whether the deep soil has been adequately characterized laterally and vertically for risk assessment and closure of Parcel A deep soil.

A review of the previous reports (listed in Appendix A) indicates that soil was investigated to depths of approximately 50 feet bgs. The water table is located at a depth of approximately 60 to 65 feet bgs. Approximately 550 soil samples were collected within 108 borings at depths ranging between 0.5 and 50 feet bgs and were analyzed for VOCs, semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), total recoverable petroleum hydrocarbons (TRPH), polychlorinated biphenyls (PCBs), pesticides, and metals. Concentrations of detected compounds are shown on Figures 4, 5, and 6 (KJC 1996 and 1997).

Organic chemicals detected in deep soil samples include:

- 1,1-Dichloroethane (1,1-DCA)
- 1,2-Dichloroethane (1,2-DCA)
- 1,1-Dichloroethene (1,1-DCE)
- 1,2-Dichloroethene (1,2-DCE)
- cis-1,2-Dichloroethene (cis-1,2-DCE)
- Tetrachloroethene (PCE)
- 1,1,1-Trichloroethane (1,1,1-TCA)
- 1,1,2-Trichloroethane (1,1,2-TCA)
- Trichloroethene (TCE)
- Aroclor 1248
- Bis(2-ethylhexyl)phthalate
- Pvrene
- Total Recoverable Petroleum Hydrocarbons (TRPH)

The Parcel A Post-Demolition Risk Assessment report (Integrated 1998a) indicates that metals concentrations measured in onsite soil samples are within natural background levels, with the exception of arsenic, beryllium, chromium, copper, and lead.

Organic chemicals detected in groundwater beneath Parcel A include:

- Carbon disulfide
- Chloroform
- 1,1-DCA
- 1,1-DCE
- cis-1,2-DCE
- trans-1,2-DCE
- Toluene
- 1,1,2-TCA
- TCE
- Trichlorofluoromethane

- 1,2,4-Trimethylbenzene
- 1,3,5 Trimethylbenzene

Review of the analytical data for the soil samples collected in Parcel A indicates that the reported chemical concentrations related to releases from Parcel A operations appear to be adequately delineated both vertically and horizontally as shown in Figures 4, 5, and 6.

#### 2.2 CHEMICALS OF POTENTIAL CONCERN

Calculation of human health risk and evaluation of threat to groundwater quality requires identification of the chemicals of potential concern (COPCs). COPCs were identified as those chemicals that could pose a human health risk due to vapor migration into buildings or a threat to groundwater quality at concentrations above drinking water standards. The COPCs for soil and groundwater are presented below, along with their maximum onsite concentrations.

### Soil

•	1,1-DCA	0.060  mg/kg
•	1,2-DCA	0.0087 mg/kg
•	1,1-DCE	0.900 mg/kg
•	1,2-DCE	0.0061 mg/kg
•	cis-1,2-DCE	0.043 mg/kg
•	PCE	0.202 mg/kg
•	1,1,1-TCA	0.015 mg/kg
•	1,1,2-TCA	0.018 mg/kg
•	TCE	0.330 mg/kg
•	Aroclor 1248	0.130 mg/kg
•	Bis (2-ethylhexyl) phthalate	0.200 mg/kg
•	Pyrene	0.100 mg/kg
•	TRPH	1,132 mg/kg

Organic chemicals detected in groundwater beneath Parcel A include:

## Groundwater

Carbon disulfide	0.002 mg/l
Chloroform	0.002 mg/l
1,1-DCA	0.018 mg/l
1,1-DCE	2.000 mg/l
cis-1,2-DCE	0.009  mg/l
trans-1,2-DCE	0.015 mg/l
	Chloroform 1,1-DCA 1,1-DCE cis-1,2-DCE

•	Toluene	0.009 mg/l
•	1,1,2-TCA	0.0013 mg/l
•	TCE	1.100 mg/l
•	Trichlorofluoromethane	0.00052 mg/l
•	1,2,4-Trimethylbenzene	0.00021 mg/l
•	1,3,5 Trimethylbenzene	0.00051 mg/l

These data were used to complete the human health and groundwater impact assessment for Parcel A deep soil. It should be noted that the potential health risks associated with TRPH are assessed according to their toxic components (e.g. PAHs and aromatic hydrocarbons such as benzene).

#### 3.0 HUMAN HEALTH RISK ASSESSMENT

Risk assessments have been performed to evaluate if chemicals present at Parcel A pose a human health risk above OEHHA approved risk levels. A post-demolition risk assessment was performed in 1998 (Integrated, 1998a) and risk assessment calculations were performed as part of this Parcel A deep soil evaluation. A brief summary of the post demolition risk assessment is provided, followed by a discussion of the human health risk assessment calculations performed for this report.

## 3.1 HISTORICAL RISK ASSESSMENTS

A post-demolition risk assessment was conducted in 1998 to evaluate "the health protectiveness of post-demolition site conditions" (Integrated 1998a). Based on a review of the post-demolition risk assessment and previous site investigation reports, the RWQCB indicated in a letter dated April 21, 1998, that no further action is required for the Parcel A shallow soil (0 to 12 feet bgs). The RWQCB also indicated that the California Human and Ecological Risk Division (HERD) agreed with the conclusion in the post-demolition risk assessment and that residual shallow soil impact risks fall within a range of values that HERD determines to be acceptable for the proposed land use, and the impact risks will not pose significant health risks for future site occupants.

Although an evaluation of human health risks from potential exposure to deep soil impacts (vapor) was performed and indicated no significant health risks, an evaluation of risk associated with existing or potential future groundwater concentrations due to migration of residual deep soil impacts was not performed. Therefore, no deep soil closure was issued. To address these risk issues, a supplemental assessment was performed.

## 3.2 SUPPLEMENTAL HUMAN HEALTH RISK ASSESSMENT

A review of the post-demolition risk assessment (Integrated 1998a) indicated that the following two human health exposure pathways associated with existing and potential future groundwater impacts were not considered:

- inhalation of VOCs in indoor air from upward VOC vapor migration from groundwater into onsite buildings, and
- inhalation of VOCs in indoor air due to VOC migration from deep soil leachate, migration to groundwater, and subsequent VOC vapor migration from groundwater into indoor air.

No other additional exposure pathways are considered complete for deep soil. Thus, the above-noted potential exposure pathways not previously addressed in the post-demolition risk assessment were evaluated and summarized herein.

The risk assessment calculations are described in Appendix B, and the results are presented in Appendices B and C. Adding the estimated risks from the above-listed pathways (risk assessment modeling output presented in Appendix C) to the potential on-site receptor risks presented in the post-demolition risk assessment do not result in risks greater than the OEHHA-approved acceptable risk levels.

## 4.0 POTENTIAL THREAT TO GROUNDWATER ASSESSMENT

The post-demolition risk assessment did not consider the potential threat to groundwater due to chemical leaching from deep soil impacts. Thus, potential degradation of groundwater quality due to chemical leaching from deep soil to groundwater was evaluated and summarized herein.

Results of our evaluation (detailed in Appendix B) indicate that leaching of maximum COPC concentrations in deep soil of Parcel A would not result in potential groundwater concentrations that are greater than MCLs, with the exception of 1,1-DCE and TCE. In addition, measured concentrations of TRPH (1,132 mg/kg) are less than their residual saturation concentration of 14,000 mg/kg in onsite soil (assumed to be silty sand) and, therefore, do not pose a threat of free product generation on the groundwater table.

The concentrations of 1,1-DCE and TCE in deep soil that exceed SSLs are identified in Figure 6. These include:

• 1,1-DCE (0.200 mg/kg) and/or TCE (0.900 mg/kg) concentrations at depths greater than 30 feet bgs in boring 1-6/2BB-1-6

- a concentration of 1,1-DCE (0.120 mg/kg) at a depth of 50 feet bgs in boring 1-23,
   and
- a concentration of TCE at depths of 25 and 30 feet bgs (0.200 and 0.150 mg/kg) in boring B15 and B-15-FS, and TCE (0.120 and 0.110 mg/kg) at depths of 40 and 50 feet bgs in boring NE-1/2BB-NE-2.

The above noted concentrations of 1,1-DCE and TCE in deep soil are less than two times greater than the SSLs, with the exception of 1,1-DCE concentrations in boring 1-6/2BB-1-6 which is almost four times greater than the SSL. It is expected that the elevated concentrations of 1,1-DCE and TCE in boring 1-6/2BB-1-6, and of TCE in boring NE-2/2BB-NE-2 will be remediated by the soil vapor extraction (SVE) treatment system scheduled to be started in April 2001. Concentrations of TCE in boring B15 and B-15-FS appear to be related to apparent releases from a former hazardous waste accumulation area nearby. These residual concentrations appear to be localized, and since the SSLs are very conservative values and the deep soil concentrations are less than two times the SSL, they do not appear to pose a significant threat to groundwater quality beneath Parcel A.

## 5.0 SUMMARY AND CONCLUSIONS

Based on the closure evaluation presented herein, it is recommended that no further action be granted by the RWQCB for deep soil impacts at Parcel A based on the following information and conclusions.

- 1. A review of the results of the deep soil investigation activities conducted at Parcel A from 1991 through 1998 indicates that both the vertical and lateral extent of soil impacts related to on-site activities have been delineated. Relatively low concentrations of 1,1-DCA, 1,2-DCA, 1,1-DCE, 1,2-DCE, cis-1,2-DCE, PCE, 1,1,1-TCA, 1,1,2-TCA, TCE, Aroclor-1248, bis(2-ethylhexyl)phthalate, Pyrene, and TRPH have been detected in onsite soil between depths of 12 and 50 feet bgs. Elevated concentrations of TCE and 1,1-DCE have been detected in onsite deep soil at depths between 25 and 50 feet bgs and in groundwater. Other chlorinated VOCs have also been detected in onsite groundwater.
- 2. In a letter from the RWQCB dated April 21, 1998, the RWQCB issued a letter of no further action for shallow soil in Parcel A. The RWQCB also indicated that the California Human and Ecological Risk Division (HERD) agreed with the conclusion in the post-demolition risk assessment and that residual shallow soil impact risks fall within a range of values that HERD determines to be acceptable for the proposed land use, and the impact risks will not pose significant health risks for future site occupants.
- 3. The post-demolition risk assessment, approved by the DTSC, indicates that deep soil does not pose a risk to human health greater than acceptable levels from inhalation of VOCs

from upward VOC vapor migration into onsite buildings. No other exposure pathways are considered complete for deep soil.

- 4. The following additional potential exposure pathways were evaluated using deep soil investigation results:
  - inhalation of VOCs in indoor air from upward VOC vapor migration from groundwater into onsite buildings, and
  - inhalation of VOCs in indoor air due to VOC migration from deep soil leachate to groundwater and subsequent upward VOC vapor migration from groundwater into indoor air.

Adding the estimated risks from the above-listed pathways to the risks calculated for potential on-site receptors, as presented in the post-demolition risk assessment, do not result in risks greater than the OEHHA-approved risk levels for the BRC Former C-6 Facility property.

5. The existing residual chemical concentrations in onsite deep soil do not pose a threat to groundwater quality at levels greater than MCLs, with the potential exception of 1,1-DCE and TCE in four boring locations. Three of these areas will likely be remediated by the proposed SVE treatment system scheduled to be started in April 2002. Concentrations of TCE in boring B15 and B-15-FS appear to be related to apparent releases from a former hazardous waste accumulation area nearby. These residual concentrations appear to be localized, and since the SSLs are very conservative values and the deep soil concentrations are less than two times the SSL, they do not appear to pose a significant threat to groundwater quality beneath Parcel A.

If you have any questions regarding the content of this letter, please contact either of the undersigned at (619) 280-9210.

Sincerely yours,

HALEY & ALDRICH, INC.

And Broughton, REA, CIH
Risk Assessment Task Manager

Richard M. Farson, P.E.

Senior Engineer

Scott Zachary Project Manager

Attachments





# **List of Attachments**

Figure 1	Parcel A Location Map
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